CLAIMS

1. A method for variably programming the synchronization of a multidimensional digital frame structure, the method comprising:

defining a frame with an overhead section having a predetermined number of bytes;

recognizing frame synchronization bytes in the frame overhead sections;

selecting a number of frames, with recognized frame synchronization bytes, required for synchronization; and

synchronizing received frames in response to the selected number of frames with recognized frame synchronization bytes.

2. The method of claim 1 further comprising:

defining a superframe structure with a predetermined number of frames per superframe; and

wherein selecting a number of frames, with recognized frame synchronization bytes, required for synchronization includes selecting a number of frames in each superframe; and

wherein synchronizing received frames in response to the selected number of frames includes synchronizing received frames in response to the selected number of frames in each superframe.

3. The method of claim 2 wherein defining a superframe structure with a predetermined number of frames per superframe includes defining a first and a second frame in the superframe; and

wherein selecting a number of frames, with recognized frame synchronization bytes, required for synchronization includes selecting frames from the group including the first frame and the second frame.

4. The method of claim 2 wherein defining a superframe structure with a predetermined number of frames per superframe includes defining a first frame in a first superframe and a first frame in a second superframe; and

wherein selecting a number of frames, with recognized frame synchronization bytes, required for synchronization includes selecting frames from the group including the first frame in the first superframe and the first frame in the second superframe.

5. The method of claim 4 wherein defining a superframe structure with a predetermined number of frames per superframe includes defining a first plurality of frames in each superframe; and

wherein selecting a number of frames, with recognized frame synchronization bytes, required for synchronization includes selecting frames from the first plurality of frames in each superframe.

6. The method of claim 5 wherein defining a superframe structure with a predetermined number of frames per superframe includes defining a second plurality of superframes; and

wherein selecting a number of frames, with recognized frame synchronization bytes, required for synchronization includes selecting a

number of consecutive superframes having frames with recognized frame synchronization bytes.

7. The method of claim 6 wherein selecting a number of frames, with recognized frame synchronization bytes, required for synchronization includes selecting a first number frames with recognized frame synchronization bytes in a second number of consecutive superframes.

8. The method of claim 7 wherein defining a superframe structure with a predetermined number of frames per superframe includes defining a superframe having four frames; and

wherein selecting a number of frames, with recognized frame synchronization bytes, required for synchronization includes recognizing frame synchronization bytes in the first frame for two consecutive superframes.

9. The method of claim 1 further comprising:

selecting the value of frame synchronization bytes in the frame overhead section.

10. The method of claim 9 wherein recognizing frame synchronization bytes in the frame overhead sections includes recognizing the value of the frame synchronization bytes.

11. The method of claim 9 wherein defining a frame includes defining each frame synchronization byte having a second plurality of bits; and

wherein selecting the value of the frame synchronization bytes includes selecting a second plurality of bits for each frame synchronization byte.

12. The method of claim 1 further comprising:

selecting the quantity of frame synchronization bytes in the frame overhead section.

13. The method of claim 12 wherein defining the frame includes defining the overhead section having a first plurality of bytes; and

wherein selecting the quantity of frame synchronization bytes in the overhead section includes selecting a first number of bytes in the range from zero to the first plurality of bytes.

14. The method of claim 12 wherein recognizing frame synchronization bytes in the frame overhead sections includes recognizing the quantity of the frame synchronization bytes.

15. The method of claim 1 further comprising:

selecting the bit error rate for the frame synchronization bytes.

16. The method of claim 15 wherein recognizing frame synchronization bytes in the frame overhead sections includes recognizing the frame synchronization bytes having a bit error rate less than, or equal to, the selected bit error rate.

17. The method of claim 15 wherein selecting a frame synchronization byte bit error rate includes selecting an average bit error rate for each selected frame.

18. The method of claim 1 further comprising:

selecting the location of the frame synchronization bytes in the frame overhead section.

19. The method of claim 18 wherein recognizing frame synchronization bytes in the frame overhead sections includes recognizing the location of the frame synchronization bytes.

20. The method of claim 1 further comprising:

selecting a number of frames, with non-recognized frame synchronization bytes, required for falling out of synchronization; and

falling out of synchronizing in response to the selected number of frames with non-recognized frame synchronization bytes.

21. A method for variably programming the synchronization of received frames in the communication of a multidimensional digital frame structure, the method comprising:

defining a frame with an overhead section having a predetermined number of bytes;

sending a frame;

receiving the frame;

recognizing frame synchronization bytes in the frame overhead sections;

selecting a number of frames, with recognized frame synchronization bytes, required for synchronization; and

synchronizing received frames in response to the selected number of frames with recognized frame synchronization bytes.

22. A receiver system for variably programming synchronization criteria in a multidimensional digital frame structure, the system comprising:

a frame receiver including an overhead receiver to process the overhead section of a frame, a payload generator to process the payload section of the frame, and a decoder to provide forward error correction (FEC) for the frame; and

wherein the overhead receiver has an input to accept commands for selecting a number of frames, with recognized frame synchronization bytes, required for synchronization, the overhead receiver synchronizing the frame in response to the selected number of frames with recognized frame synchronization bytes.

23. The system of claim 22 wherein the frame receiver defines a superframe structure with a predetermined number of frames per superframe; and

wherein the overhead receiver selects a number of frames in each superframe, and synchronizes received frames in response to the selected number of frames in each superframe with recognized frame synchronization bytes.

24. The system of claim 23 wherein the frame receiver defines a first and a second frame in the superframe; and

wherein the overhead receiver selects frames from the group including the first frame and the second frame.

25. The system of claim 23 wherein the frame receiver defines a first frame in a first superframe and a first frame in a second superframe; and

wherein the overhead receiver selects frames from the group including the first frame in the first superframe and the first frame in the second superframe.

26. The system of claim 25 wherein the frame receiver defines a first plurality of frames in each superframe; and

wherein the overhead receiver selects frames from the first plurality of frames in each superframe.

27. The system of claim 26 wherein the frame receiver defines a second plurality of superframes; and

wherein the overhead receiver selects a number of consecutive superframes having frames with recognized frame synchronization bytes.

28. The system of claim 27 wherein the frame receiver selects a first number frames with recognized frame synchronization bytes in a second number of consecutive superframes.

29. The system of claim 28 wherein the frame receiver defines a superframe having four frames; and

wherein the overhead receiver recognizes frame synchronization bytes in the first frame for two consecutive superframes.

30. The system of claim 22 wherein the overhead receiver selects the value of frame synchronization bytes in the frame overhead section.

31. The system of claim 30 wherein the overhead receiver recognizes frame synchronization bytes in the frame overhead sections in response to recognizing the value of the frame synchronization bytes.

32. The system of claim 30 wherein the frame receiver defines each frame synchronization byte having a second plurality of bits; and

wherein the overhead receiver selects a second plurality of bits for each frame synchronization byte.

33. The system of claim 22 wherein the overhead receiver selects the quantity of frame synchronization bytes in the frame overhead section.

34. The system of claim 33 wherein the frame receiver defines the overhead section having a first plurality of bytes; and

wherein the overhead receiver selects a first number of bytes in the range from zero to the first plurality of bytes.

35. The system of claim 33 wherein the overhead receiver recognizes frame synchronization bytes in the frame overhead sections in response to recognizing the number of the frame synchronization bytes.

36. The system of claim 22 wherein the overhead receiver selects the bit error rate for the frame synchronization bytes.

37. The system of claim 36 wherein the overhead receiver recognizes frame synchronization bytes having a bit error rate less than, or equal to, the selected bit error rate.

38. The system of claim 36 wherein the overhead receiver selects an average bit error rate for each selected frame.

39. The system of claim 22 wherein the overhead receiver selects the location of the frame synchronization bytes in the frame overhead section.

40. The system of claim 39 wherein the overhead receiver recognizes frame synchronization bytes in the frame overhead sections in response to recognizing the location of the frame synchronization bytes.

41. The system of claim 22 wherein the overhead receiver selects a number of frames, with non-recognized frame synchronization bytes, required for falling out of synchronization; and

wherein the frame receiver falls out of synchronizing in response to the selected number of frames with non-recognized frame synchronization bytes.

42. A system for variably programming the synchronization of a multidimensional digital frame structure, the system comprising:

a frame generator including an overhead generator to generate the overhead section of a frame, a payload generator to generate the payload section of the frame, and an encoder to provide forward error correction (FEC) for the frame;

a frame receiver including an overhead receiver to process the overhead section of a frame, a payload generator to process the payload section of the frame, and a decoder to provide forward error correction (FEC) for the frame; and

wherein the overhead receiver has an input to accept commands for selecting a number of frames, with recognized frame synchronization bytes, required for synchronization, the overhead receiver synchronizing the frame in response to the selected number of frames with recognized frame synchronization bytes.